No. 676,922. Patented June 25, 1901.

J. SOHNER.

STEAM BOILER.

(Application filed Jan. 24, 1901.)

(No Model.)

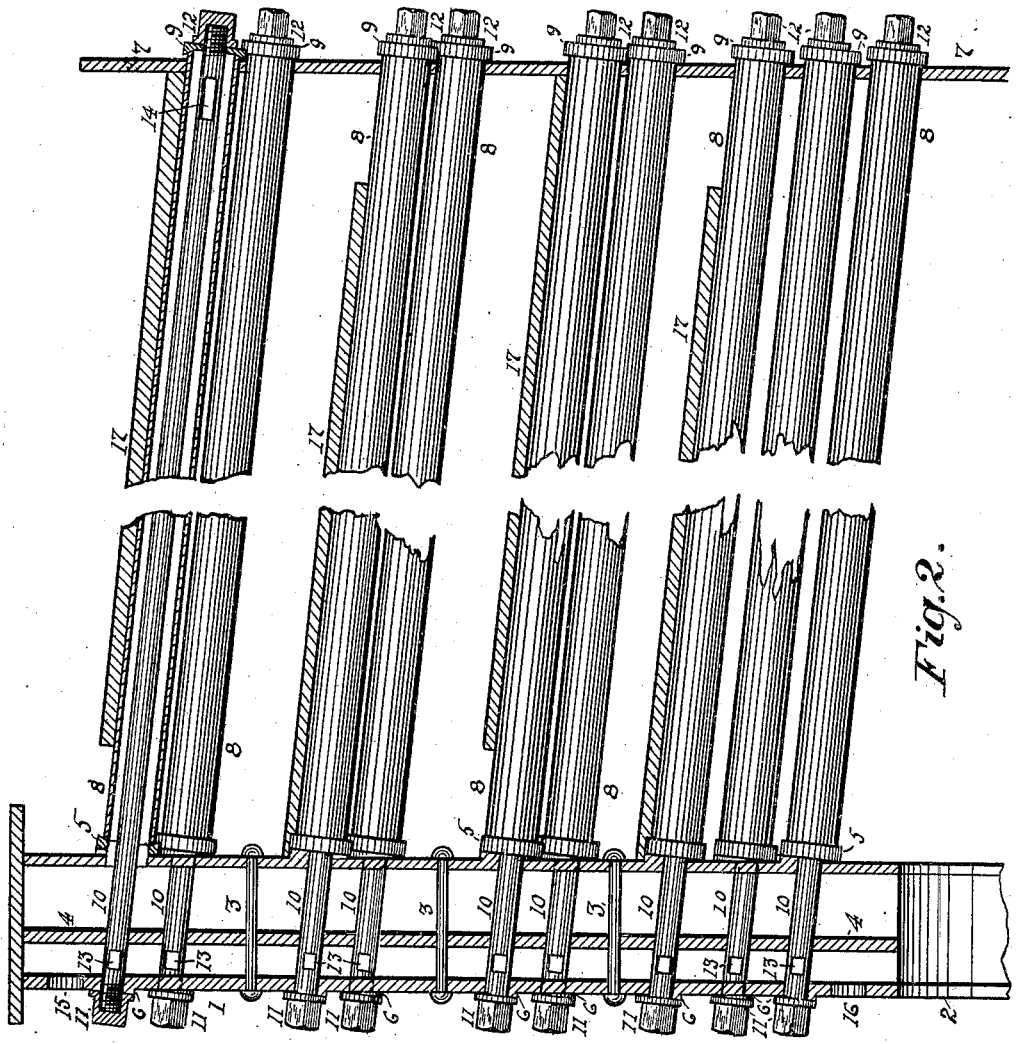

Fig. 2.

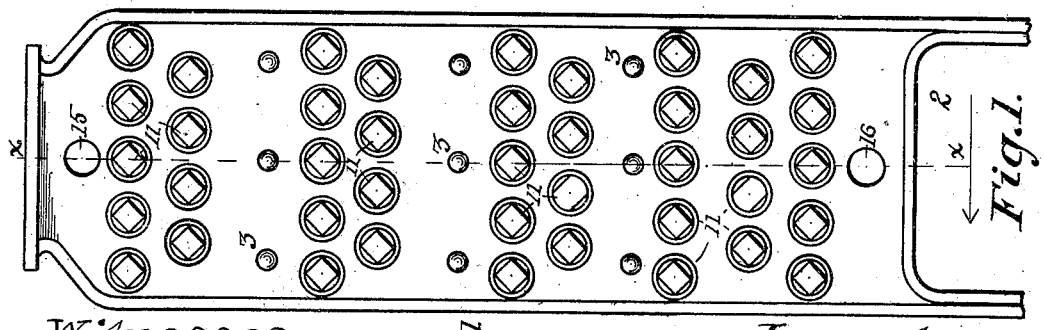

Fig. 1.

Witnesses:

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UNITED STATES PATENT OFFICE.

JOSEPH SOHNER, OF BARBERTON, OHIO.

STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 676,922, dated June 25, 1901.

Application filed January 24, 1901. Serial No. 44,620. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH SOHNER, a citizen of the United States, residing at Barberton, in the county of Summit and State of Ohio, have invented a certain new and useful Improvement in Steam-Boilers, of which the following is a specification.

My invention has relation to improvements in that class of steam-boilers in which the heating-surface is distributed into ranks of tubes arranged above the furnace and opening at one or both ends into connecting-chambers.

The object of my invention is to produce a new and improved boiler of the general class named that shall embody inner circulation-tubes, baffle-plates to direct the products of combustion along the tubes to secure the greatest heating effect, and to make the several parts readily detachable for the purpose of cleansing and repairs.

To the aforesaid object my invention consists in the peculiar and novel construction, arrangement, and combination of parts hereinafter described and then specifically pointed out in the claims, reference being had to the accompanying drawings, forming a part of this specification.

In the accompanying drawings, in which similar reference-numerals indicate like parts in both views, Figure 1 is a front elevation of my improved boiler, and Fig. 2 a central vertical longitudinal section of the same at the line X X of Fig. 1.

Referring to the drawings, 1 is a hollow chamber, of boiler-plate, being in front elevation an elongated parallelogram, the lower end being curved, as shown, to form a firing-hole 2. The side walls are stayed at intervals by bolts 3, and between the side walls is interposed a diaphragm 4, thus dividing the chamber into two compartments. The outer walls of the chamber are pierced at intervals with holes for forming connection with the water-tubes, which holes are inclined, as shown, the holes in the right wall being of like size with the internal diameter of the larger tubes, the holes in the left wall being in alinement with the larger holes and arranged to accurately fit the outside of the smaller pipe. The diaphragm 4 has corresponding holes in alinement with the holes in the outer walls of the chamber and adapted to fit the smaller pipes. About the holes in the right plate of the chamber are raised annular conical seals or sockets 5 to receive, fit, and form a tight joint with the ends of the larger pipes, one of which seals or sockets is shown in section in Fig. 2. About the holes in the left plate of the chamber are annular bosses or seats 6, having smooth outer faces to form seats for cap-nuts, to be described. Opposite the chamber 1 is a supporting-plate 7, having holes to receive and sustain the larger pipe in alinement with the holes in the chamber 1.

The larger tubes 8 are arranged with one end resting in and against the sockets 5 and the other extending through the plate 7, against which ends are fitted to be pressed annular disks 9 to form tight joints therewith, the central opening in said disks being fitted to receive the inner tubes.

Inside each tube 8 is a smaller tube 10, which extends through the chamber 1 and plate 7, each end being threaded and arranged to receive cap-nuts 11 12, the former bearing against the seals 6 and the latter against the disks 9, thus binding the parts securely together. Near the ends of the tubes 10 are openings 13 14, thus placing them in internal connection with the interior of the chamber 1 and the interior of the tubes 8.

In the front of the chamber 1 are openings 15 16, adapted to be closed by hand-hole covers in the usual manner and provided for the purpose of reaching the interior of the chamber for washing and like use. The top rank of each set of larger tubes is covered by a baffle-plate 17 of any approved material, each of which plates extends from the chamber 1 or plate 7 nearly the length of the tube, leaving at one end a passage for the products of combustion, these passages alternating in succeeding plates. By this construction and arrangement I secure great heating-surface and perfect circulation, while any of the tubes may be readily and quickly removed for cleaning or repairs.

I claim as my invention—

1. An improved boiler of the kind specified consisting of a hollow chamber with openings in one wall provided with outer annular seats to receive the ends of large pipes, and smaller

openings in the opposite wall in alinement with the first openings with outer annular seats to receive cap-nuts, with ranks of large tubes resting against the seats of the first wall and in open connection with said chamber, and provided with caps having central openings to close their opposite ends, and smaller tubes centrally located in said first tubes extending through the second wall, having openings near their ends leading into the larger tubes and chamber respectively, screw-threaded at their ends, and closed by cap-nuts resting against the seats of the front chamber-wall at one end, and against the caps having central openings at the other, substantially as shown and described.

2. An improved boiler of the kind specified, consisting of a hollow chamber with openings in it, one wall provided with outer annular seats to receive the ends of large pipes and smaller openings in the opposite wall in alinement with said first openings with outer annular seats to receive cap-nuts, with ranks of large tubes resting against seats of the first wall and in open connection with said chamber, provided with caps having central openings to close their opposite ends and smaller tubes centrally located in said first tubes extending through the second wall with openings near their ends leading into the larger tubes and chamber respectively screw-threaded at their ends and closed by cap-nuts adapted to bear against the seats of the front chamber-wall at one end and draw the corresponding ends of the larger tubes against the other chamber-wall and prevent the expansion of said chamber-walls under pressure, substantially as shown and described.

In testimony that I claim the above I hereunto set my hand in the presence of two subscribing witnesses.

JOSEPH SOHNER.

In presence of—
C. E. HUMPHREY,
C. P. HUMPHREY.